

DISCOVER-AQ: An Overview and Initial Comparisons of NO₂ with OMI Observations

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The first deployment of the Earth Venture -1 DISCOVER-AQ (Deriving Information on Surface conditions from Column and Vertically Resolved Observations Relevant to Air Quality) project was conducted during July 2011 in the Baltimore-Washington region. Two aircraft (a P-3B for in-situ sampling and a King Air for remote sensing) were used along with an extensive array of surface-based in-situ and remote sensing instrumentation. Fourteen flight days were accomplished by both aircraft and over 250 profiles of trace gases and aerosols were performed by the P-3B over surface air quality monitoring stations, which were specially outfitted with sunphotometers and Pandora UV/Vis spectrometers. The King Air flew with the High Spectral Resolution Lidar for aerosols and the ACAM UV/Vis spectrometer for trace gases. This suite of observations allows linkage of surface air quality with the vertical distributions of gases and aerosols, with remotely-sensed column amounts observed from the surface and from the King Air, and with satellite observations from Aura (OMI and TES), GOME-2, MODIS and GOES. The DISCOVER-AQ data will allow determination of under what conditions satellite retrievals are indicative of surface air quality, and they will be useful in planning new satellites. In addition to an overview of the project, a preliminary comparison of tropospheric column NO₂ densities from the integration of in-situ P-3B observations, from the Pandoras and ACAM, and from the new Goddard OMI NO₂ algorithm will be presented.